IS 10716-3 (1999): Technical Product Documentation - Springs, Part 3: Vocabulary [PGD 24: Drawings]

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भारतीय मानक

तकनीकी उत्पाद प्रलेखन — स्प्रिंग

भाग 3 शब्दावली

Indian Standard

TECHNICAL PRODUCT DOCUMENTATION — SPRINGS

PART 3 VOCABULARY

ICS 01.100.20; 21.160

BUREAU OF INDIAN STANDARDS
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Price Group 2

NATIONAL FOREWORD

This Indian Standard (Part 3) which is identical with ISO 2162-3 : 1993 'Technical product documentation — Springs — Part 3 : Vocabulary' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of Drawings Sectional Committee and approval of Light Mechanical Engineering Division Council.

This standard was originally published in 1983 by adopting ISO 2162 : 1973 'Technical drawings — Representation of springs'. ISO 2162 has since been revised in 1993 by splitting it into the following three parts, under the general title 'Technical product documentation — Springs'.

Part 1 Simplified representation

Part 2 Presentation of data for cylindrical helical compression springs

Part 3 Vocabulary

In view of the above, the committee responsible for the formulation of this standard has also decided to revise IS 10716 : 1983 splitting into three parts by adopting the above three parts of ISO 2162 respectively.

This standard (Part 3) defines terms for description of springs and their characteristics to be used in technical product documentation. Other parts of this series are given as follows:

IS 10716 (Part 1) : 1999 Technical product documentation — Springs : Part 1 Simplified representation (*first revision*)

IS 10716 (Part 2) : 1999 Technical product documentation — Springs : Part 2 Presentation of data for cylindrical helical compression springs

The text of ISO has been approved as suitable for publication as Indian Standard without deviations. Certain conventions are, however, not identical to those used in the Indian Standards. Attention is especially drawn to the following:

Wherever the words, 'International Standard' appear, referring to this standard, they should be read as 'Indian Standard'.

Indian Standard

TECHNICAL PRODUCT DOCUMENTATION — SPRINGS

PART 3 VOCABULARY

1 Scope

This part of ISO 2162 defines terms for the description of springs and their characterstics to be used in technical product documentation.

2 Description of springs

2.1 spring: Mechanical device designed to store energy when deflected and to return the equivalent amount of energy when released.

2.2 auxiliary spring: Additional spring mounted beneath the main (suspension) spring which is activated when the main spring load is reached.

The applied load is carried partly by the main spring and partly by the auxiliary spring.

2.3 compression spring: Spring that offers resistance to a compressive force applied axially.

2.4 constant force spring: Spring the force of which exerted for uncoiling uniformly constant with each unit length of deflection.

It is normally used as a moving spring and is made from strip material in a coiled shape. Its inner ends are free to rotate.

2.5 disc spring (Belleville): Spring washer, in the form of a frustrum of a cone, having constant material thickness and used as a compression spring.

2.6 extension spring: Spring that offers resistance to an axial force tending to extend its length, with or without initial tension.

2.7 flat spring: Spring made from flat strip or rectangular-shaped bar stock which deflects in the same way as a cantilever or a simple beam.

2.8 garter spring: Long, close-coiled, extension spring whose ends are joined to form a ring.

Garter springs are used principally in mechanical seals or shafting, to hold round segments together, as a belt, and as a holding device.

2.9 helical compression spring: Compression spring made from wire of circular, square or rectangular cross-section wound around an axis with distances between its coils.

Helical compression springs are available in cylindrical or other forms, e.g. conical, double-conical (convex: barrel spring; concave: waisted spring) or tapered.

2.10 helical extension spring: Extension spring normally made from wire of circular cross-section wound around an axis with or without spaces between its coils (open- or close-wound).

2.11 helical torsion spring: Torsion spring normally made from wire of circular cross-section wound around an axis and with ends suitable for transmitting a twisting moment.

2.12 helper spring: Additional spring mounted above the main (suspension) spring which is activated when its spring load is reached.

The applied load will be carried mostly by the main spring and only to a small extent by the helper spring.

2.13 leaf spring: Spring made from one or more strips of flat or parabolic material having different lengths, arranged one above the other and taking account of the varying bending moments along the strip.

2.14 spiral spring: Spring usually made by winding flat or rectangular material onto itself in the form of a spiral.

It is designed to be wound up and to exert a return torque around the spring axis, proportional to the angular deviation.

2.15 torsion spring: Spring that offers resistance to a twisting moment around the longitudinal axis of the spring.

2.16 torsion bar spring: Torsion spring made from straight bars or rods of given cross-section.

2.17 volute spring: Compression spring (conical) made from material of rectangular cross-section, shaped so that its coils are capable of telescoping.

3 Characteristics of springs

3.1 coils, active: Number of coils used in computing the total deflection of a spring.

3.2 coils, total (of compression springs): Number of active coils plus coils forming the ends.

3.3 deflection, total: Displacement of a spring from the free position to the maximum operating position.

In a compression spring, the total deflection is the difference between the free length and the solid length.

3.4 force: That force exerted on or by a spring in order to reproduce or modify motion, or to maintain a system of forces in equilibrium.

3.5 helix, direction of: Direction in which the coil recedes, viewed from one end of the spring.

The direction of helix is right-hand (RH) when the coil recedes in a clockwise direction and left-hand (LH) when it recedes in a counterclockwise direction.

3.6 length, free: Overall length of a spring to which no external force has been applied.

3.7 length, solid: Overall length of a compression spring when all coils are fully compressed.

3.8 length test: Test on a spring to determine its length under a given force.

3.9 relaxation: Loss of force of a spring with time when deflected to a fixed position.

3.10 spring load: Force exerted by or on the spring when it is extended or compressed to a given length.

3.11 spring pitch: Distance between adjacent active coils of a spring in the free position, as measured in the axial direction between the centres of the material cross-section.

3.12 spring set; permanent set in fatigue: Permanent distortion from the manufactured dimensions which occurs when a spring is stressed beyond the elastic limit of the material.

3.13 spring rate

(1) Force required to deflect a compression or extension spring by one unit of length (axial spring rate).

(2) Force (twisting moment) required to deflect a torsion spring by one angular unit (transverse spring rate).

3.14 stress correction factor: Factor expressing the fact that the distribution of torsion stress across the wire diameter is not symmertrical.

NOTE 1 This stress is higher in the inside of the coil than it is on the outside.

3.15 stress relief: Removal of residual stresses caused during the forming operation by applying a low-temperature heat treatment after coiling or bending.

Depending on the heat treatment applied, stress relief is also known as "strain relief", "stress equalizing", "tempering", "blueing" and "baking".

3.16 tension, initial: Force wound into helical extension springs during the coiling operation.

It keeps the coils tightly closed and must be exceeded by an applied force before the coils begin to open.

Alphabetical index

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act,* 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards : Monthly Additions'.

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Amendments Issued Since Publication

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